Acta Zootaxonomica Sinica, 34 (3): 554- 559 (July, 2009) ISSN 1000-0739
动物分类学报

内蒙古道虎沟中侏罗世原毛蚊科 (昆虫纲, 双翅目) 昆虫化石

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摘 要 描述原毛蚊科 Protopleciidae Rohdendorf, 1946 化石 3 新种, 弯曲中生原毛蚊 *Mesopleaia anfracta* sp. nov.; 古中生原毛蚊 *Mesopleaia antiqua* sp. nov.; 联合中生原毛蚊 *Mesoplecia coadnata* sp. nov.。所有标本均采自内蒙古宁城道虎沟中侏罗世九龙山组, 模式标本保存在首都师范大学生命科学学院。

关键词 原毛蚊科, 新种, 化石, 中侏罗世, 内蒙古.
中图分类号 Q915. 819. 7

原毛蚊科 Protopleciidae Rohdendorf, 1946 是 Rohdendorf 在 1946 年建立的, 是双翅目长角亚目中的 1 个已灭绝科, 该科的研究是从 3 个属开始的: *Protoplecia* Handlirsch、*Mesoplecia* Rohdendorf、*Mesopleciella* Rohdendeorf (Evenhuis, 1994)。1987 年 Kovalev 将原毛蚊科的属种从 Pleciofungivoridae 移到了原毛蚊科里, 即将原来置于 Pleciofungivorid 的 *Rhaetofungivora* Rohdendorf 的 14 个种移到了原毛蚊科里 (Kovalev, 1987), 但是遗憾的是 Kovalev 没有将其归到任何 1 个属。Blagoderov (1996) 认为应该将 Palaeopleciidae 和 Protoligoneuridae 2 个科归到原毛蚊科里, 其后将其中的 11 个种放到了其他属里 (Evenhuis, 1994)。1988 年 Crosskey 把 *Simulidium prisaum* 也归到了原毛蚊科里 (Evenhuis, 1994)。该科目前世界已知有 16 属: *Architipleciomima* Rohdendorf, 1962; *Dyspolyneura* Rohdendorf, 1961; *Hebeipleaia* Hong, 1983; *Mesopleaia* Rohdendorf, 1938; *Mesopleciaella* Rohdendorf, 1946; *Palaeopleaia* Rohdendorf, 1962; *Paraoligus* Lin, 1976; *Prohousea* Jarzembowski, 1939; *Pleaiopsis* Hong, 1983; *Protoligoneura* Rohdendorf, 1962; *Protoleaia* Handlirsch, 1906; *Pseudoplecia* Hong & Wang, 1990; *Sinolecia* Lin, 1976; *Sunoplecia* Hong, 1983; *Simulidium* Westwood, 1854; *Epimesopleaia* Zhang, 2007 (Evenhuis, 1994; Zhang, 2007)。中国现已发表9 属 15 种。

本文研究的中生原毛蚊属 *Mesoplecia* Rohdendorf, 1938 迄今为止在西伯利亚和中国大量发现, 不包括本文的 3 新种已有 11 种发表描述, 地质年代都为侏罗纪, 即 *M. mesopleaiella* Rohdendorf, 1946; *M. archihesperinus phryneoides* Rohdendorf, 1962; *M. palaeohesperinus longipennis* Rohdendorf, 1962; *M. rohdendorfomyidla* Kalugina & Kovalev, 1985; *M. guidongensis* Lin, 1986; *M. incorporalis* Kovalev, 1985; *M. longipennis* Rohdendorf, 1962; *M. minor* Rohdendorf, 1946; *M. phrgneoides* Rohdendorf, 1962; *M. siniaa* Zhang, 2007; *M. mediana* Zhang, 2007 (Evenhuis, 1994; Zhang, 2007)。

自内蒙古宁城道虎沟的九龙山组 (Jiulongshan Formation) 地层中采到大量的昆虫化石, 其中包括本文的几件原毛蚊科的化石。从昆虫化石组合面貌来看, 其地质时代应归为中侏罗世 (Ren, 2002)。本文的 3 个新种化石保存有清晰的翅脉特征, 并且有两个新种的化石提供了相对较为完整的身体结构, 为鉴定分类提供了有力的证据。

本文化石的鉴定和初步描绘主要借助于 Leica MZ12. 5 显微镜附带绘图仪辅助完成, 部分线条图借助于 CorelDraw 12 绘图软件完成。

原毛蚊科 Protopleciidae Rohdendorf, 1946

中生原毛蚊属 Mesoplecia Rohdendorf, 1938

Mesoplecia Rohdendorf, 1938. Trudy paleontol. *Inst. Akad. Nauk SSSR*, 7 (3): 29-67.

Mesoplecia Rohdendorf, 1964. Trudy paleontol. *Inst. Akad. Nauk SSSR*, 100: 1-311.

Mesoplecia Hong, 1984. Paleontological Atlas of North China. 384pp.

Mesoplecia Kalugina & Kovalev, 1985. Trudy paleontol. *Inst. Akad. Nauk SSSR*, 198pp.

Mesoplecia Kovalev, 1990. Trudy paleontol. *Inst. Akad. Nauk SSSR*, 239, 224pp.

Mesoplecia Zhang, 2007. *Cretaceous Research*, 28: 289-296.

国家自然科学基金 (40872022)、北京自然科学基金 (5082002)、北京市属高等学校人才强教深化计划高层次人才资助项目和北京市教委重点项目 (KZ200910028005) 共同资助.

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收稿日期: 2008-10-15, 修订日期: 2009-04-30.

属征　头小，触角 16 节，长圆锥形，最少 3 倍长于头部；体粗壮多毛，足细长或短粗，胫节有端距，翅发达，脉明显并多有暗色翅痣。腹部粗长。R 脉 3 条，M 脉 3 条。

分布：俄罗斯，英国，德国，吉尔吉斯斯坦，哈萨克斯坦；中国。

弯曲中生原毛蚊，新种 Mesoplecia anfracta **sp. nov.** (图 1，5)

身体长 11 mm，头胸部保存下来，结构不是很清楚，触角和口器没有保存下来。腹部完整，明显分为 8 节，但生殖器不清楚。足保存部分，较粗壮，多毛。

翅长 7.5 mm，翅宽 3 mm。翅膜质。Sc 短，大概为翅长的一半，末端稍弯曲。R_1 较直，末端稍弯曲；R_{2+3} 短且呈 S 形，且与 R_1 的 1/3 部联合。翅痣区域较小。Rs 分为 R_{2+3} 和 R_{4+5}，R_{4+5} 很长且直，末端没有弯曲。横脉 r-m 连接 R_{4+5} 和 M_{1+2}。M 分为 3 支。M_1 和 M_2 几乎等长，M_{3+4} 长，无横脉 m-m；横脉 m-cu 连接 M_{3+4} 和 Cu。Cu 末端稍弯曲，A_1 缺失。

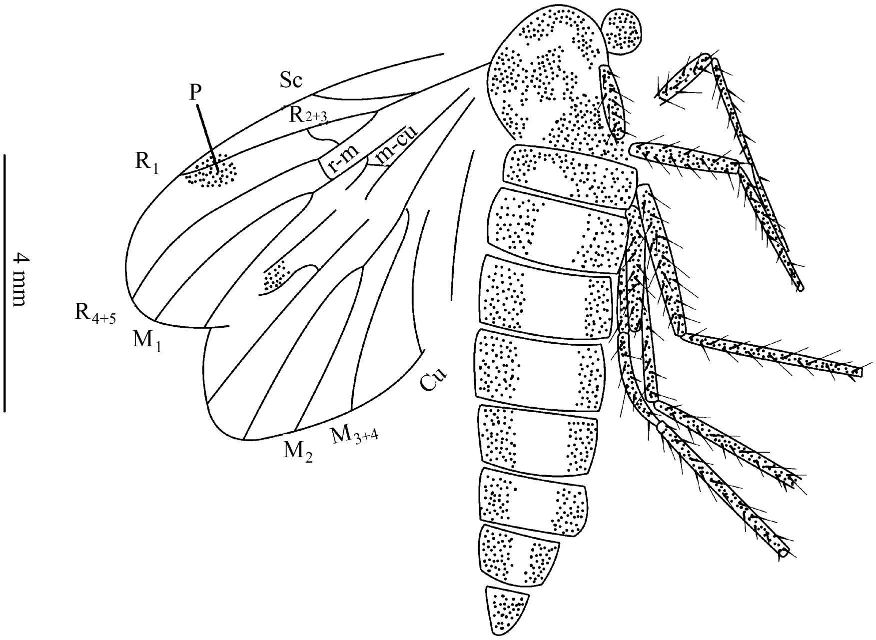


图 1　弯曲中生原毛蚊，新种 *Mesoplecia anfracta* sp. nov.，正模 (holotype)

正模，编号：CNU-DIP-D-NN2008131，1 件保存稍显粗糙的化石标本，头胸腹部都保存下来，足缺失部分，左右翅稍显欠缺。

产地及层位：内蒙古宁城，道虎沟中侏罗世九龙山组。

时间及采集人：任东于 2005 年 9 月 2 日采集。

讨论　该种翅缘没有加厚，R_{2+3} 短且弯曲，连接于 R_1 的位置，横脉 r-m 短且垂直于 R_{4+5} 和 M_{1+2}，是区别与其他种的重要特征。

词源："*anfracta*" 是拉丁词，意思是 "弯曲的"。

古中生原毛蚊，新种 Mesoplecia antiqua **sp. nov.** (图 2~3，6)

身体长 7.5 mm，头胸部保存下来，结构不是很清楚，触角保存下来，分节不是很明显。腹部完整，明显分为 8 节，但生殖器不清楚。足保存部分，较粗壮，多毛。

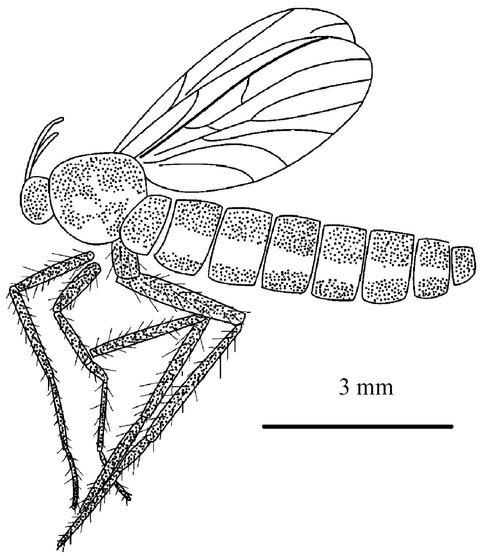
翅长 4.5 mm，翅宽 2 mm。翅膜质，全翅差不多同样的厚度除了 R_1 加厚外。Sc 短，大概为翅长的一半，末端稍弯曲。R_1 较直，末端稍弯曲；R_{2+3} 短且呈 S 形，且与 R_1 中部联合，这也是该种的鉴定特征。无翅痣。Rs 分为 R_{2+3} 和 R_{4+5}，R_{4+5} 很长且直，末端没有弯曲。横脉 r-m 连接 R_{4+5} 和 M_{1+2}。M 分为 3 支，这是 1 个把这个种放到这个属的鉴别特征。M_1 和 M_2 几乎等长，M_{3+4} 长，无横脉 m-m 和 m-cu。Cu 末端稍弯曲，A_1 短且末端弯曲。

正模，编号：CNU-DIP-D-NN2008096，1 件保存比较精美的化石标本，头胸腹部基本保存完整，触角明显，足保存大部分。

产地及层位：内蒙古宁城，道虎沟中侏罗世九龙山组。

时间及采集人：任东于 2005 年 9 月 2 日采集。

讨论　该种的 R_1 脉明加粗，且 R_{2+3} 短且弯曲并在 R_1 脉的中间位置与其相连，横脉 r-m 的连接位置是区别于其他种的特征。



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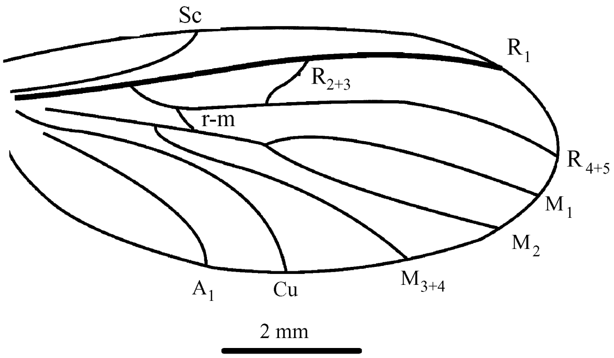

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图 2~3 古中生原毛蚊，新种 *Mesopleaia antiqua* sp. nov.，正模（holotype）
2. 身体（body） 3. 翅背面观（wing, dorsal view）

词源："*antiqua*" 是拉丁词，意思是"古老的，陈旧的"。

联合中生原毛蚊，新种 Mesoplecia coadnata **sp. nov.**（图 4，7）

身体长 8 mm，头胸部保存下来，结构不是很清楚，触角和口器没有保存下来。腹部完整，明显分为 8 节，但生殖器不清楚。足保存部分，较粗壮，多毛。

翅长 6 mm，翅宽 3 mm。翅缘加厚，全翅厚度相同。Sc 脉短，大概为翅长的一半，末端稍弯曲。R_1 较直，加厚，末端稍弯曲；R_{2+3} 短且呈 S 形，且与 R_1 末端联合。翅痣的区域较小。Rs 分为 R_{2+3} 和 R_{4+5}，R_{4+5} 很长且直，末端没有弯曲。横脉 r-m 连接 R_{4+5} 和 M_{1+2}。M 分为 3 支。M_1 和 M_2 几乎等长，M_{3+4} 长，无横脉 m-m。Cu 在横脉 m-cu 下弯曲厉害，在以上稍直；A_1 缺失。

正模，编号：CNU-DIP-D-NN2008003，1 件保存完整精美的化石标本，头胸腹部保存完整，缺触角

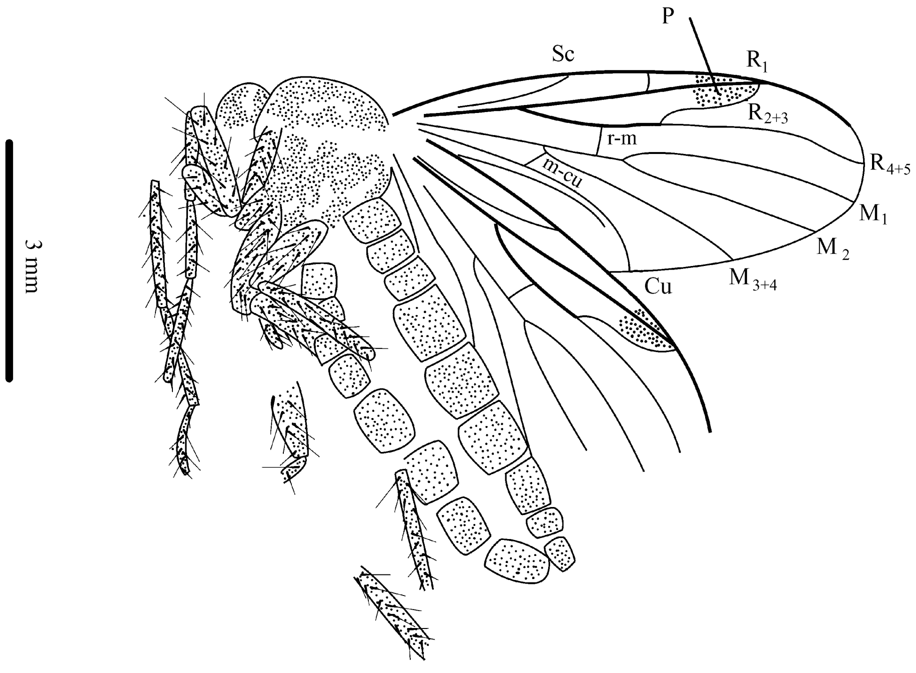

图 4 联合中生原毛蚊，新种 *Mesopleaia coadnata* sp. nov.，正模（holotype）

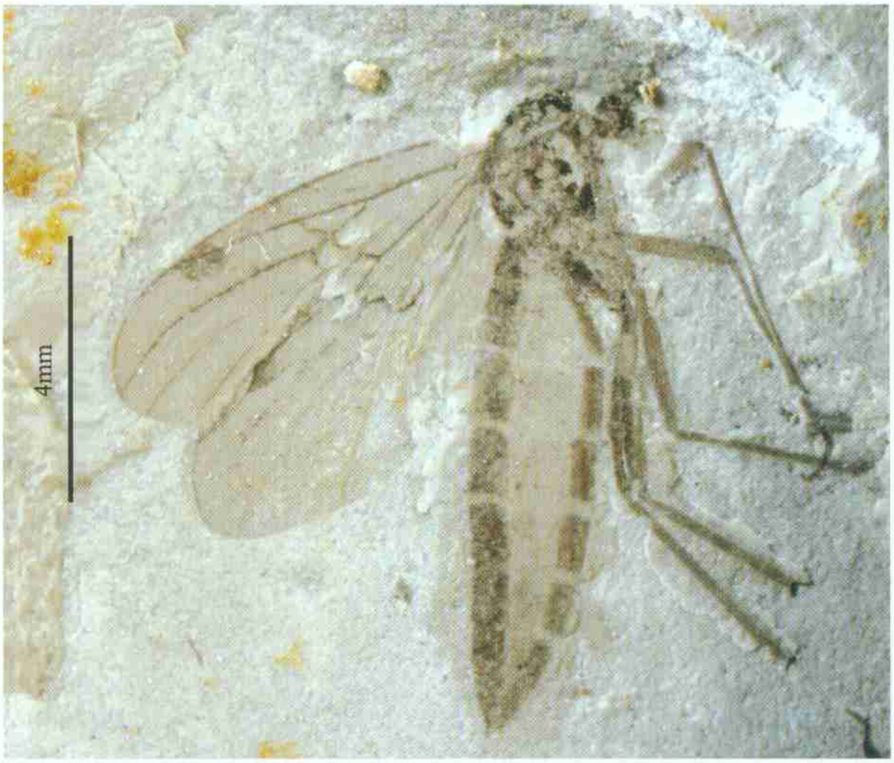

图 5 弯曲中生原毛蚊, 新种 *Mesopleaia anfradta* sp. nov.

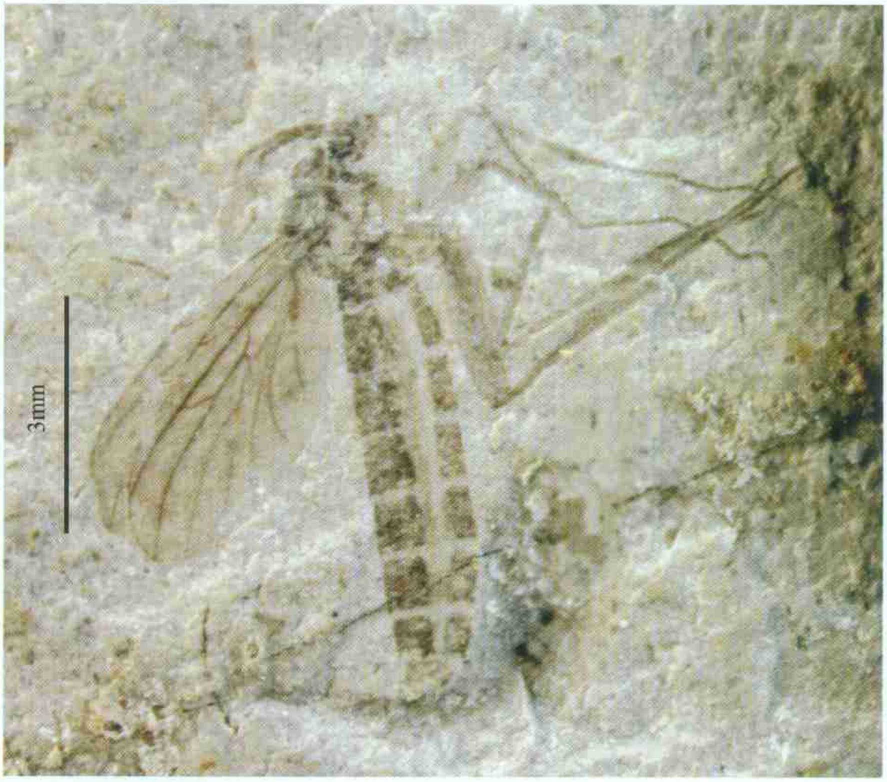

图 6 古中生原毛蚊, 新种 *Mesopleaia antiqua* sp. nov.

图 7 联合中生原毛蚊, 新种 *Mesoplecia coadnata* sp. nov.

和口器, 足仅存部分, 左右翅保存良好, 翅脉清晰。副模 3 块, 编号: CNU-DIP-D-NN2008021, CNU-DIP-D-NN2008094, CNU-DIP-D-NN2008098, 保存良好的副模化石标本。

产地及层位: 内蒙古宁城, 道虎沟中侏罗世九龙山组。

时间及采集人: 任东于 2005 年 9 月 2 日采集。

讨论 该种的翅缘有明显加厚, 且 R_{2+3} 与 R_1 脉末端联合, 藉此可将本种与本属已知种加以区分。

词源: "*coadnata*" 是拉丁词, 意思是 "联合的, 合生的"。

致谢 承南开大学王新华教授的悉心指导, 本实验室王莹、李艳丽等同学的帮助, 在此一并表示感谢!

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Rohdendorf, B. B. 1964. Historical development of dipterous insects. *Turdy Paleontol. Inst. Akad. Nauk SSSR*, 100: 1-311.

Zhang, J-F 2007. New Mesozoic Protopleciidae (Insecta: Diptera: Nematocera) from China. *Cretaceous Reserch*, 28: 289-296.

MIDDLE JURASSIC PROTOPLECIIDAE FROM DAOHUGOU, INNER MONGOLIA, CHINA (INSECTA, DIPTERA)

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Abstract In this paper three new species of fossil Protopleciidae are described: *Mesoplecia coadnata* sp. nov.; *M. antiqua* sp. nov. and *M. anfracta* sp. nov. All the specimens were collected from Middle Jurassic Jiulongshan Formation of Inner Mongolia in China. All type specimens are deposited in the Capital Normal University.

Mesoplecia anfracta **sp. nov.** (Figs. 1, 4)

Description. Body length 11 mm as preserved. Thorax massive and nearly oval, abdomen with 8 visible segments, subcylindrical. Legs stronger and covered with sparse bristles. Antennae missing.

Wing length 7.5 mm and width 3 mm. All veins of nearly same thickness. Sc short, little short than one-half length of wing; R_1 three-fourths wing length; Rs arising from basal one-third wing length, furcated R_{2+3} and R_{4+5}. R_{2+3} short and curved, strongly sigmoid, convergent middle of R_1. M stem well developed with exception of basal section, furcated three branches; M_1 as long as M_2. Cu slightly sigmoid. A_1 missing.

Holotype. A well-preserved body with wings, No. CNU-DIP-D-NN2008131. Horizon and locality. Jiulongshan Formation, Middle Jurassic, Daohugou Village, Ningcheng County, Inner Mongolia in China.

Comparison. The new species is similar to *M. coadnata* sp. nov., but it can be easily separated from later by having different position of R_{2+3}. The new species has convergence of middle length of R_1. Compared to other recorded species in the genus, this present new species differs from *M. antique* sp. nov. mainly in crossvein m-cu.

Etymology. From Latin "*anfracta*", means "curving".

Mesoplecia antiqua **sp. nov.** (Figs. 2, 5)

Description. Body length 7.5 mm as preserved. Thorax massive and nearly oval, abdomen with 8 visible segments, subcylindrical. Legs stronger and covered with sparse bristles. Antennae preserved.

Wing length 4.5 mm and width 2 mm. All veins of nearly same thickness. Sc short, little short than one-half length of wing; R_1 three-fourths wing length and thicken; Rs arising from basal one-third wing length, furcated R_{2+3} and R_{4+5}. R_{2+3} short and curved, strongly sigmoid, convergent middle of R_1. M stem well developed with exception of basal section, furcated three branches; M_1 as long as M_2. Cu slightly sigmoid. A_1 reaching wing margin and curved terminally..

Holotype. Body with well preserved wings, No. CNU-DIP-D-NN2008096. Horizon and locality. Jiulongshan Formation, Middle Jurassic, Daohugou Village, Ningcheng County, Inner Mongolia in China.

Comparison. The new species is similar to *M. coadnata* sp. nov., but it can be easily separated from later by having different position of R_{2+3}. The new species has convergence of middle length of R_1.

Etymology. From Latin "*antiqua*", means "antiquated".

Mesoplecia coadnata **sp. nov.** (Figs. 3, 6)

Description. Body length 8 mm as preserved. Thorax massive and nearly oval, abdomen with 8 visible segments, subcylindrical. Legs stronger and covered with sparse bristles. Antennae missing.

Wing length 6 mm and width 3 mm. All veins with same thickness. Sc short, slight shorter than one-half length of wing; Pt small. R_1 three-fourths of wing length and thicken; Rs thicken, arising from basal one-third of wing length, furcated R_{2+3} and R_{4+5}. R_{2+3} curved, strongly sigmoid, convergent R_1 terminally. M stem well developed with exception of basal section, furcated three branches; M_1 as long as M_2. Cu slightly sigmoid beyond m-cu. A_1 missing.

Holotype. A well-preserved body with wings, No.: CNU-DIP-D-NN2008003. Paratype. No. CNU-DIP-D-NN2008021, No. CNU-DIP-D-NN2008094, No. CNU-DIP-D-NN2008098. Horizon and locality. Jiulongshan Formation, Middle Jurassic, Daohugou Village, Ningcheng County, Inner Mongolia in China.

Remarks. The new species is similar to *M. sinica*, but it can be easily separated from later by having different position of R_{2+3}. The new species has convergence of R_{2+3} with R_1.

Etymology. From Latin "*coadnata*", means "combine".

Key words Protopleciidae, new species, fossil, Middle Jurassic, Inner Monglia.

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